

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Toshiyuki KAWAGUCHI et al.

Confirmation No.: 2257

Serial No.: 10/538,132

Group Art Unit: 1773

Filed: June 9, 2005

Examiner: Gary D. Harris

For: ELECTROMAGNETIC NOISE SUPPRESSOR, STRUCTURE WITH  
ELECTROMAGNETIC NOISE SUPPRESSING FUNCTION, AND METHOD OF  
MANUFACTURING THE SAME

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER 37 C.F.R. §1.132**

Sir:

1. I, Sakiko Sugihara, the undersigned declarant, of c/o Shiga International Patent Office, GranTokyo South Tower, 1-9-2 Marunouchi, Chiyoda-ku, Tokyo 100-6620 Japan, understand both English and Japanese.
2. I translated into English page 8, lines 6-14, of Japanese International Application No. PCT/JP2004/002104.
3. The English translation of Japanese International Application No. PCT/JP2004/002104, (hereinafter "the International Application"), was filed as the above-captioned application, the United States national phase of the International Application.
4. The English translation of lines 6-14 of the International Application which I prepared is attached hereto as Exhibit 1, and the corresponding English text of the above-captioned filed application appears on page 16, line 18, to page 17, line 13, thereof, (hereinafter "English text of this application").
5. The English translation of lines 6-14 of the International Application corresponds to the English text of this application, except that the phrase "the magnetic material layer" appearing on page 16, line 25, to page 17, line 1 of the English text of this application has been changed to --the composite layer -- in the English translation of lines 6-14 of the International Application.

6. The difference between the English translation of lines 6-14 of the International Application and the English text of this application, referred to in paragraph 5 of this Declaration, is due to an error in the translation of the International Application which was filed as the above-captioned application.

7. The occurrence of this error is confirmed by the appearance of the same Japanese characters “複合層”, which are circled on a copy of page 8 of the International Application, attached hereto as Exhibit 2, corresponding to the English phrase “the composite layer”, appearing on page 16, line 18, of the English text of this application, and corresponding to the English phrase “the magnetic material layer”, erroneously appearing on page 16, line 25, to page 17, line 1, of the English text of this application.

8. The occurrence of this error is further confirmed by the appearance of Japanese characters “磁性体”, which are enclosed in a rectangle on the attached copy of page 8 of the International Application, corresponding to the English phrase “the magnetic material layer” appearing on page 16, line 24, of the English text of this application, the Japanese characters being different from the Japanese characters specified in paragraph 7 of this Declaration.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: August 21, 2008

Sakiko Sugihara  
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## **EXHIBIT 1**

The thickness of the composite layer is the depth of infiltration of the atoms of the magnetic material into the surface layer of the binding agent, that is dependent on such factors as the weight of the magnetic material deposited, kind of the binding agent and the conditions of physical vapor deposition, and is roughly in a range from 1.5 to 3 times the thickness of the magnetic material layer formed by the vapor deposition. When the thickness of the composite layer is set to be not less than 0.005  $\mu\text{m}$ , atoms of the magnetic material and the binding agent can be integrated in a dispersed state, giving rise to a high loss characteristic in high frequency region due to the morphological anisotropy, thus achieving sufficient electromagnetic noise suppressing effect. When the thickness of the composite layer exceeds 3  $\mu\text{m}$ , on the other hand, a clear crystalline structure and then a homogeneous film of the magnetic material is formed to form a bulk magnetic material. This leads to a decrease in morphological anisotropy and less electromagnetic noise suppressing effect. Therefore, thickness of the composite layer is preferably 1  $\mu\text{m}$  or less, more preferably 0.3  $\mu\text{m}$  or less.

**EXHIBIT 2**

格子4が観察される部分と、非常に小さい範囲で磁性体が存在しない結合剤2のみが観察される部分と、磁性体原子5が結晶化せず結合剤中に分散して観察される部分からなっている。すなわち、磁性体が明瞭な結晶構造を有する微粒子として存在を示す粒界は観察されず、ナノオーダーで磁性体と結合剤が一体化した複雑なヘテロ構造（不均質・不斉構造）を有しているものと考えられる。

複合層の厚さは、結合剤の表層に磁性体原子が浸入した深さであり、磁性体の蒸着質量、結合剤材質、物理的蒸着の条件などに依存し、およそ磁性体の蒸着厚さの1.5～3倍程となる。複合層の厚さを0.005  $\mu\text{m}$ 以上とすることにより、磁性体原子の結合剤との分散一体化ができ、形状異方性に由来する高周波領域での大きな損失特性を有するものと思われ、充分な電磁波ノイズ抑制効果を発揮させることができる。一方、複合層の厚さが3  $\mu\text{m}$ を超えると、明瞭な結晶構造を経て均質な磁性体膜が形成され、バルクの磁性体に戻ってしまい形状異方性が減少し、電磁波ノイズ抑制効果も小さくなり、実効的ではない。それ故、複合層の厚さは1  $\mu\text{m}$ 以下が望ましく、さらには0.3  $\mu\text{m}$ 以下が望ましい。

結合剤は、特に限定されないが、例えば、ポリオレフィン系樹脂、ポリアミド系樹脂、ポリエステル系樹脂、ポリエーテル系樹脂、ポリケトン系樹脂、ポリイミド系樹脂、ポリウレタン系樹脂、ポリシロキサン系樹脂、フェノール系樹脂、エポキシ系樹脂、アクリル系樹脂、ポリアクリレート樹脂などの樹脂や、天然ゴム、イソプレングム、ブタジエンゴム、スチレンブタジエンゴムなどのジエン系ゴム、ブチルゴム、エチレンプロピレンゴム、ウレタンゴム、シリコーンゴムなどの非ジエン系ゴム等の有機物が挙げられる。これらは熱可塑性であってもよく、熱硬化性であってもよく、その未硬化物であってもよい。また、上述の樹脂、ゴムなどの変性物、混合物、共重合物であってもよい。

また、結合剤は、後述する低い剪断弾性率を有する無機物であってもよく、アエロゲル、発泡シリカなどの空隙部が大きく、超微粒子の捕獲が行える硬度を有するものであればこれも用いることができる。また前記有機物との複合物であっても構わない。

中でも、結合剤としては、結合剤への磁性体原子の入り込みやすさの点で、後述する磁性体の物理的蒸着に際してその剪断弾性率が低いものが好ましく、具体